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ABSTRACT

This paper describes a graduate curriculum in research and philosophy of science that was developed over a number of years at the California State University-Fullerton Counseling Program. The three objectives of the curriculum are presented, i.e., to provide a forum for discussion of issues generic to psychology; to provide a framework for evaluating different methods of inquiry and practice; and to enable master's level counseling students to integrate their practitioner training with knowledge of research methods and alternative epistemologies for theory testing. The overall design of this competency-based curriculum is discussed covering four broad areas of inquiry: (1) the epistemological foundation of science; (2) classical reductive experimentation; (3) the transcendence of classical science; and (4) phenomenology. The paper concludes with observations on students' response to the curriculum and its program effects. An outline of the curriculum content and course handouts are appended. (BL)

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A GRADUATE CURRICULUM IN RESEARCH AND PHILOSOPHY OF SCIENCE

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A Graduate Curriculum in Research and Philosophy of Science: Summary

This paper describes a graduate curriculum developed over a number of years (at the California State University-Fullerton Counseling program), which attempts to achieve the following objectives: (1) To provide a forum for discussion of issues generic to psychology, which is seldom available to graduate students specializing in a sub-area of psychology other than philosophical psychology; (2) To provide a framework for evaluating different methods of inquiry and practice where history may illuminate current problems and future needs; and (3) To enable master's level counseling students to integrate their "practitioner" training with knowledge of research methods and alternative epistemologies for theory testing. These objectives are to be considered in the light of the Zeitgeist of separatism and a psychology charged with ameaningful inquiry and misdirection.

The content areas in the curriculum will be presented. The major topics covered are: (1) Paradigm change and the unique position of psychology in relation to other sciences and its own history; (2) Review of the goals, epistemological foundations and methods of science from a historical perspective, from antique science through classical reductive experimentation to the post-Kantian modern phase; (3) Research and quantitative methodology of the classical empiricist tradition; (4) Problems with classical science; the crisis of objectivity, the issue of reflexivity, and problems with meaning; (5) Transcendence of classical science; contributions of Phenomenology and System epistemology; (6) Alternative methods of inquiry and practice; illustration of "qualitative" research methods and phenomenological procedures in field research and clinical practice; and (7) Synthesis of research methods; implications of

a system epistemology for theory testing and conceptual discoveries in the practice of psychology.

The teaching resources and mechanisms used with this curriculum will be described. Observations on students' response to the curriculum and its program effects will be offered. Given the characteristics of the students concerned, and the particular training philosophy of the program for which this curriculum was developed, generalization is cautioned.

Future possibilities in this area of teaching are envisioned, including the offering of similar courses in doctoral level programs. The challenge of such a curriculum are discussed in terms of its demands on instructional latitude and its value in providing a broad integrative framework for training in psychology and related fields.

The curriculum in research and philosophy of science described in this presentation is a product of several years of development. Its philosophical frame was set by Michael Parker, now Chair of the graduate Counseling Psychology program at the California State University-Fullerton. The training approach and effects intended in this curriculum offer a glimpse into the background of ideas which have shaped the Counseling program of which it is a part. Some of the elements are still evolving, and represent a continuing effort to respond to the generic and training issues in our field.

The design of this curriculum has been conceived in the context of a growing awareness of the limitations of methods of inquiry used by psychologists and behavioral scientists. This awareness becomes acute when considering the practice of psychological knowledge in counseling and other "applied fields" where scientific theories have not produced substantive results. The sense that our field is perhaps misdirected and unresponsive to the "crisis of understanding" felt by all areas of inquiry has led some to urge for a closer look at our fundamental assumptions about psychology as a science (Dallmayr & McCarthy, 1977; Koch, 1978; Sarason, 1981). Yet, few graduate training programs in psychology have a commitment to critical analysis of our basic methods of knowing and the paradigms popularized by the Zeitgeist. The graduate practitioner and researcher has few options but to perpetuate the ways of the profession without a means to gauge the profound implications of its methods and orientation. Decisions about training directions continue to be made in an atmosphere of separatism between theory

and practice, as well as between different theoretical orientations and methodological choices (Cook & Reichardt, 1980; Staats, 1981). There is a need in training programs not only for a forum to discuss these broader issues, but also for a way of articulating training with an integrative framework which addresses such issues.

The objectives and contents of the present curriculum are described on the poster illustrations. This curriculum aims towards developing a perspective on the changing definitions of science and psychology's unique position by first providing students with a sense of history. The goals, epistemological assumptions, and methods of science as practised in different historical periods are examined and contrasted. A working distinction is used to differentiate science prior to logical positivism from the classical empiricist period and its modern transcendence by post-Kantian philosophies. It is within this historical framework that specific research methods are taught.

The standard research methodology (research design and quantitative methods) offered in most graduate programs is taught as the bulk of a first semester course. This is done, however, in the context of discussing the assumptions of induction and dualism, and the implications of methodological behaviorism. The uses and standards of these research methods are illustrated, and emphasis placed on critique of the research literature. This is followed by a discussion of problems with reductive experimentation, including issues of objectivity, meaning, observer embeddedness and reflexivity, etc. The rest of the coursework is devoted to the contributions of Phenomenology and System epistemology to the transcendence of the classical reductive framework. Alternative methods of inquiry represented by ethnographic and qualitative

research methods and phenomenological approaches are covered. Their use in field research is compared to the application of Phenomenology and System epistemology in clinical practice. This treatment of alternative methods of inquiry and practice culminates in a synthesis of all research methods covered in the curriculum. The role of language in theory construction, and the role of personal knowing in theory testing and therapeutic practice are highlighted. Students are encouraged to consider the nature of consciousness in the scientific process, and to re-examine the dichotomies of theory and practice, quantitative versus qualitative methods, and scientific versus Humanistic understanding.

Given the nature of the two-year Counseling program, a great deal of material has to be covered in the first course. Some of the techniques in the classical empiricist tradition as well as the interpretive approaches are reinforced in a second semester course which deals with methods of observation and assessment. A didactic-practicum module is being evolved such that students will have actual experience with participant observation and techniques of field research useful to the practitioner-researcher.

It should be mentioned that the California State University-Fullerton Counseling program is competency based. Hence, teaching resources and mechanisms are targeted at the eventual demonstration of comprehension of the issues and methods involved. A highly selective approach has to be used in covering the span of skills and knowledge encompassed by the curriculum. This we have attempted to do partly by providing students with a workbook on the major competencies, in addition to session outlines and relevant readings.

In the area of history and philosophy of science, reference materials are less readily available. Few readings can be found which integrate research and philosophy of science with a discussion of generic issues in psychology (Bolton, 1979; Kendler, 1981; Rychlak, 1977; Westland, 1978). Even fewer have approached the Pragmatic nature of science from a philosophical and psychological standpoint. As an outgrowth of years of teaching and thinking about the subject, my colleague Michael Parker recently completed a graduate level text of this nature, titled An Introduction to Theoretical Analysis, which has added to the teaching resources for this curriculum.

For those who wonder about the impact of the curriculum on the students, an honest appraisal consists of the following. Most students seem initially overwhelmed by the broad framework adopted, and continue to be awed by the subject matter. Many students seeking counselor training seem not to identify themselves with research and tend to be resistant especially to learning about quantitative methods. Yet, in spite of the great demands of the curriculum, our students have over the years demonstrated a satisfactory level of competency. Some, if not all, have clearly demonstrated an appreciation for the complex and context-bound nature of inquiry as well as the relationship between scientific knowing and personal knowing. A certain shift also appears to have occurred with respect to understanding the implications of the various dichotomies which plague our field. Other intended effects which are probably not very evident from the rough outline of curriculum description are difficult to capture in this report. To name a few, it continues to be our hope that this curriculum will help bring about a new perspective on the relationship of science and Humanism, and an appreciation for the value

of transformative constructions, and the relevance of research to existential problems.

The demands of the curriculum are definitely felt in the instructional latitude it requires. This demand seems well justified, however, by the value of the curriculum in providing an integrative framework for training. The issues and standards discussed in the courses have definite utility when applied to the critique of theories of pathology and methods of clinical practice. The continuity of skills also extends into the assessment area and all areas of research. A suggestion for the future would be to create more opportunities for experiential learning. Course related practicums in research methods and program evaluation could be developed.

It has been a real challenge for us to implement this curriculum at the master's degree level of training. I invite our colleagues who are involved in doctoral training programs to consider a similar effort. While our experience is to be qualified by the unique characteristics of our training program and our student population,[1] it testifies to the viability of the curriculum also at the two-year master's degree level.

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[1] Students in the California State University-Fullerton Counseling program average 34 years of age, and typically have an undergraduate Behavioral Science background as well as work experience in the helping professions.

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APPENDED MATERIAL for Paper: "A Graduate Curriculum in Research and Philosophy of Science", presented by Lisa Tsoi Hoshmand at the Western Psychological Association Conference, April 1983, San Francisco, California.

. CURRICULUM CONTENT

Poster outline of four instructional areas and the topics covered.

. HANDOUTS

Science in Historical Perspective

Comparison of Antique Science & Classical Science

Comparison of Classical Science & Modern Phase

Modern Phase Inquiry: Process & Method

CURRICULUM CONTENTS

Area I. Epistemological Foundation of Science.

Topics:

1) Epistemological Foundation; Goals, Assumptions, Methods, and Justification.

2) Man as a Scientist; Personal Constructs, Personal Paradigms, and Personal Knowing.

3) Science in Three Historical Phases: Antique, Classical, and Modern.

4) Comparison between Antique and Classical Science.

5) Problems of Classical Positivistic Empiricism: The Crisis of Understanding.

Area II. Classical Reductive Experimentation.

Topics:

1) Basic Concepts and Parameters of Empirical Research.

2) Quantitative Methods; Descriptive and Inferential Statistics.

3) Research Design and Methodology.

4) Analysis and Critique of Research.

Area III. Transcendence of Classical Science.

Topics:

1) The Basis of Modern Phase Inquiry; the Transcendence.

2) Comparison of Classical Science and Modern Phase Alternative.

3) Modern Phase Inquiry Process.

4) Ethnographic and Qualitative/Interpretive Research Methods.

Area IV. Phenomenology.

Topics:

1) Phenomenological Concepts and Procedures.

2) Clinical Applications of Phenomenology.

3) Synthesis of Empirical Methods and Phenomenology.

SCIENCE IN HISTORICAL PERSPECTIVE

ANTIQUE SCIENCE	300--500 B.C.	Rationalist philosophers
Early roots of determinism; lawfulness of nature	Pythagoras	Order
	Heraclitus	Logos (rationale)
	Democritus	Atom, Nonrandom order
	Socrates	Speculative argument--deductive discourse as method.
First transcendence; anticipated Kant's idealism	Plato	Beyond speculation; focus on philosopher's mode of thought (forms, ideas).
Forefather of the classical scientist; traces of realism	Aristotle	Syllogistic reasoning from known cases--more deductive arguments. Reality as determinant and independent of the mind. Theory of causes; material, efficient, formal, final.
Rationalism	Euclid	Axioms; mathematicized universe.
	2nd Century A.D. Ptolemy	Geocentric universe.
	13th Century A.D. St. Thomas Aquinas	Arguments from divine order.

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Emergence of CLASSICAL SCIENCE	16th Century Copernicus	Heleocentric universe; the Copernican Revolution. Gravity.
	Gilbert	Experimental method.
	17th Century	Geographic discoveries (Columbus)
Empiricism	Bacon	Scientific explanation and proof. Nature as reducible to simple forms.
Mechanistic world view	Galileo, Kepler	Law of uniform acceleration, inertia, proof. Planetary motion.
Hard determinism	Hobbes	Scientific method, proof, abstract science.
(thoughtful objections)	Descartes	Free will; humans as ontologically different from other beings. Soul vs. machine.
	Sydenham	Empirical medicine.
British Empiricism	Locke	Mind as tabula rasa. Ideas come from sensory inputs exclusively.
	18th Century Newton	Mechanization of nature; mathematicized motion. Absolute time & space.
German Idealism	Leibniz	Mind not a tabula rasa (contra Locke). Apperception; active perception.
	Barkeley	Mind fashions both primary and secondary qualities. Association of ideas.
Empiricist tradition	Hume	Nature determines human judgement.
	19th Century Mills	Cannons of logic help elucidate efficient causes in events.

SCIENCE IN HISTORICAL PERSPECTIVE

Emergence of MODERN PHASE	19th Century	
The Second Transcendence	Kant	A priori truths and catagories of understanding lend meaning to sensory input. Knowledge begins in experience, but not arising from experience alone. Intuition gives form to perception. Noumena (thing-in-itself) not the same as Phenomena (perceived appearance of things). Purpose, will, and active faculties of mind.
	Hegel	Formal cause. Possiblizing reality.
	Schopenhauer	Man's ideas constitute reality. Will
	20th Century	
	Mach	Phenomenological physics.
	James	Psychological study of mind.
	Nietzsche	Cause as not in nature, but fiction used by thinkers to account for things. Will to power as tendency in existence.
Continental Phenomenology	Husserl	Study of spontaneous experience. Intentionality in perception.
	Heidegger	
	Cassirer	Mind creates knowledge through symbolic forms.
	Dewey	Psychology of science.
	Mead	Meaning and the role of language & symbols
Shifts in the role of logic	Russell	Logic & math as symbolic lang. of truth.
	Carnap	Distinguished from empirical truth.
	Wittgenstein	Language cannot contradict logic. Tautology fails to say anything about world.
	Ayer	Verification principle; observation essential.
Continuing Empiricist tradition	Bridgeman	Operational definitions.
Non-Euclidean World	Einstein	Relativity; no constants or absolutes in time, space, or motion. Concepts relative to reference frame. New physics.

Comparison of Antique Science and Classical Science

	GOALS	ASSUMPTIONS	METHODS	STANDARDS	PROBLEMS
Antique Science	Search for truth or underlying order in nature.	Conviction brings knowledge.	Deductive arguments based on known general principles or a priori truths given in axioms and premises.	Logical grounds; law of non-contradiction. Higher authority invoked in self-evident truths.	No empirical basis for known general principles. Blind faith and dogmatism. Logic cannot produce facts or validate them.
Classical Science	Determination of natural laws. Prediction and control. Anti-scholasticism and institutionalised dogma.	Nature is lawful and reducible to regularities. Dualism; the objective and the subjective are to be separated.	Systematic inductive observations under controlled conditions. Operational definition. Quantification and measurement. Inferences based on representative cases. Hypothetic-deductive approach of theory testing and validation through experimentation.	Sufficiency and representativeness of observational data base. Precision in description. Objectivity. Replicability.	Inductive assumption itself is difficult to justify. Problem with dualism and riddle of correspondence. Problem of meaning. Embeddedness of the observer; reflexivity issue.

	Classical Science POSITIVISTIC OBJECTIVISM	Modern Phase PHENOMENOLOGICAL ALTERNATIVE ?
Epistemological Foundation	Dualism; object-subject split. Human existence and nature as independent. Follows efficient cause conceptions of causality.	Intentionality; human existence and the world co-constitute reality by reciprocal implication. Formal and final cause; non-linear conception of causality.
Assumptions	Inductive assumption of lawfulness in in nature asserted but not proven. Human beings considered ontologically no different than other objects of study; human phenomenon is deterministic and reducible to natural laws.	Human phenomenon is irreducible by natural science standards; human beings are different than other subjects of study.
Attitudes and Approach	Theoretical; distance between theory and experience, between the researcher and the subject of study. Dichotomizing of theory and practice. Researcher affirms own experience but denies subjects'. Science as a special way of perceiving.	Trusting in experience. Self-reflexive. Treats subject as a co-investigator. Non-literal-minded; reality as a multi-stable phenomenon. Psychology of the scientist as an integral part of science.
Values	Pragmatic.	Humanistic and "pragmatic" in a different sense.
Goals	To predict and control.	To illuminate and understand.
Method	Reductive experimentation; operationalization, quantification, control and manipulation. Decontexualized observation and planned experience as basis for data gathering. Method dictates content. Tends to be nomothetic.	Descriptive study of appearance and experience. Participant observation and systematic manipulation of experience. Content-method-approach unity; each method evoked by each phenomenon and the aims of each investigator. Tends to be idiographic.
Criteria	"Objectivity".	Meaningfulness and fidelity to phenomenon.

MODERN PHASE INQUIRY

Process	Method
IMMERSION	
Approach general area of interest with minimal preconceptions and assumptions. Investigator familiarizes self with the phenomenon as constituted by people-setting interactions. Observations described with low level mapping and inferences. Natural events used as stimuli in order to have least response restriction on the informants.	Bracketing; adopt atheoretical attitude. Participant observation; open-ended interviews, intense local observations, role taking and partial identification with the informants. Ethnography and stream of behavior records. Critical incidents method, sentence completion, etc.
DISCOVERY*	
Uncover all relevant contexts; multiple perspectives and meanings. Identify emergent questions and hypotheses (problem-selection), based on personal knowing.	Horizontalization; consult all points of view, and use all types of data. Obtain subject generated (emic) categories. Consult subjects in identifying context relevant research questions. Make pragmatic decisions.
ANALYSIS & INTERPRETATION*	
Look for invariant themes and patterns (relationship between variables).	Phenomenological deconstruction; adopt polymorphic attitude, Content analysis; reconstruction and hermeneutics. Inter-subjective verification and partial validation with the source (informant).
SYSTEMATIC INQUIRY*	
Test interpretations on a small scale. Evolve program of research.	Systematic manipulation of assumptions, fantasy variations. Intense local observations and single case studies. Conduct series of "crucial experiments" leading to large scale replication; quantification and statistical inferences involved.

*Backloop to earlier points in the process when necessary, as guided by data and personal knowing.